

# M208 Group Theory Models

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In Group Theory 1, we introduce the concept of a group using the idea of symmetry and consider the symmetries of the *platonic solids*.

The regular tetrahedron has 4 faces, each an equilateral triangle.

The cube has 6 faces, each a square.

The octahedron has 8 faces, each an equilateral triangle.

The dodecahedron has 12 faces, each a regular pentagon.

The icosahedron has 20 faces, each an equilateral triangle.

We have supplied 'nets' for each of the platonic solids but it is *not* essential that you make these models.

## ASSEMBLY INSTRUCTIONS

### **Standard method**

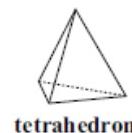
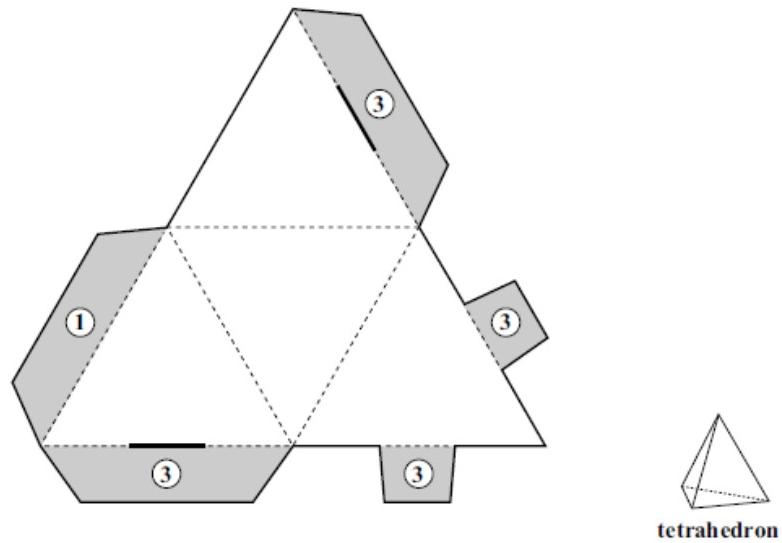
You will need scissors, glue and preferably a sharp knife or scalpel. A glue stick or fast-drying craft glue are the easiest glues to work with.

1. Cut along the solid lines of each net. Do *not* cut along any *dashed* lines.
2. Make a slot where indicated on each large tab 3.
3. Fold along each dashed line – those joining faces to faces, and those joining faces to tabs. (You may find it easier to lightly score along these dashed lines first.)
4. Apply a small amount of glue to each tab 1, and begin to assemble the polyhedron by sticking each tab 1 to the back of the adjacent face.
5. Apply a small amount of glue to each tab 2, and stick each tab 2 to the back of the adjacent face. (It may be helpful to wait until the glue is dry before going on to step 6.)
6. Complete the polyhedron by posting each small tab 3 through the slot in the corresponding large tab 3. You may find it helpful to apply a small amount of glue to these tabs first.

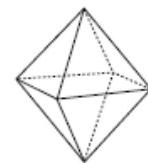
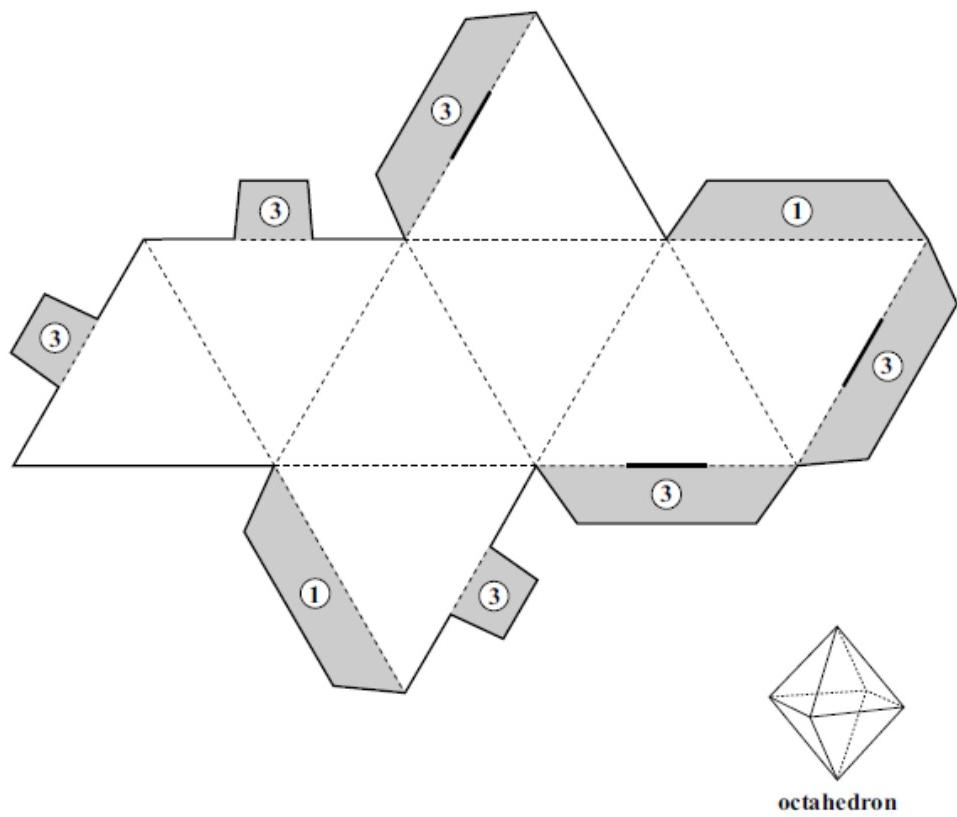
### **Short-cut method**

You will need scissors and sticky tape. Simply cut out the net without the tabs, lightly score and fold along the dashed lines, and assemble the polyhedron by applying sticky tape on the outside.

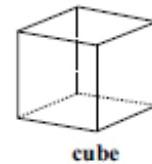
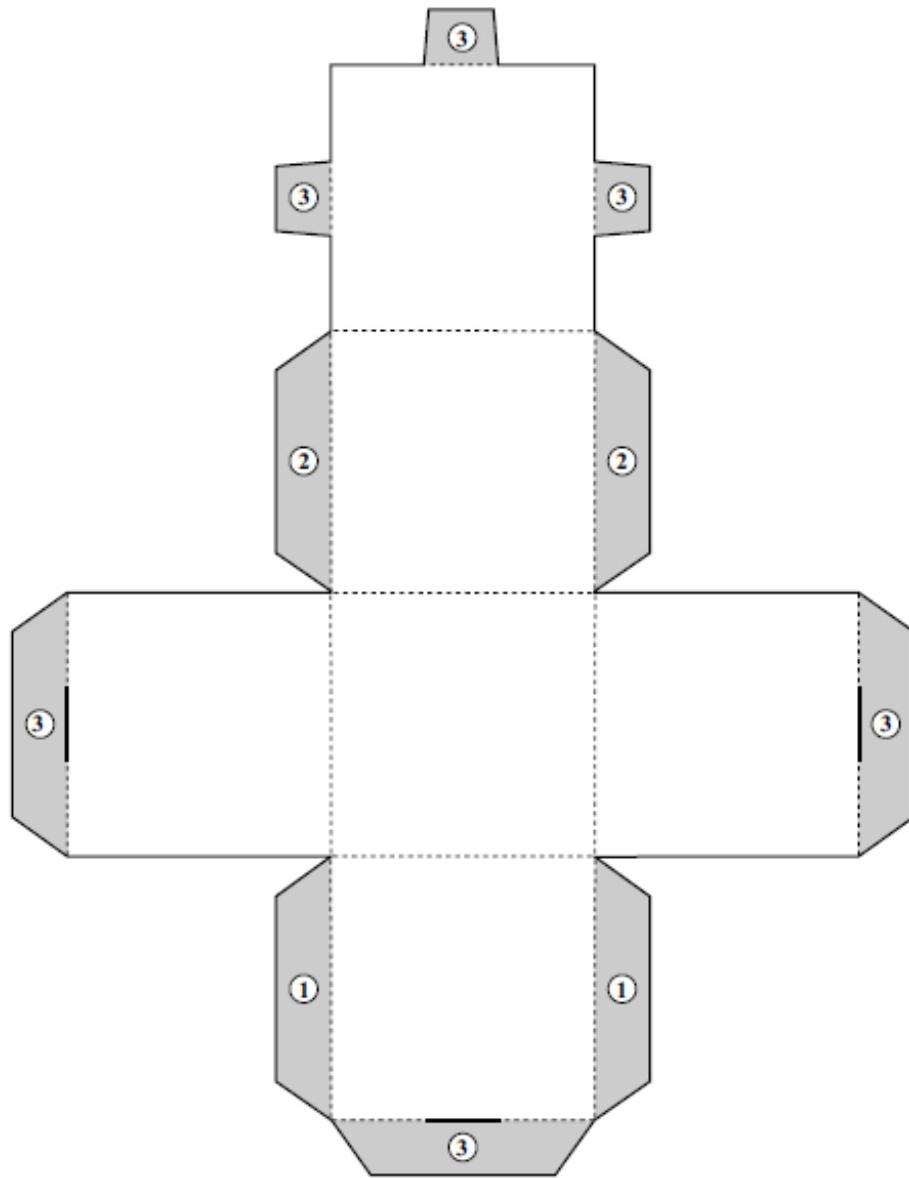
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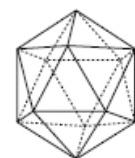
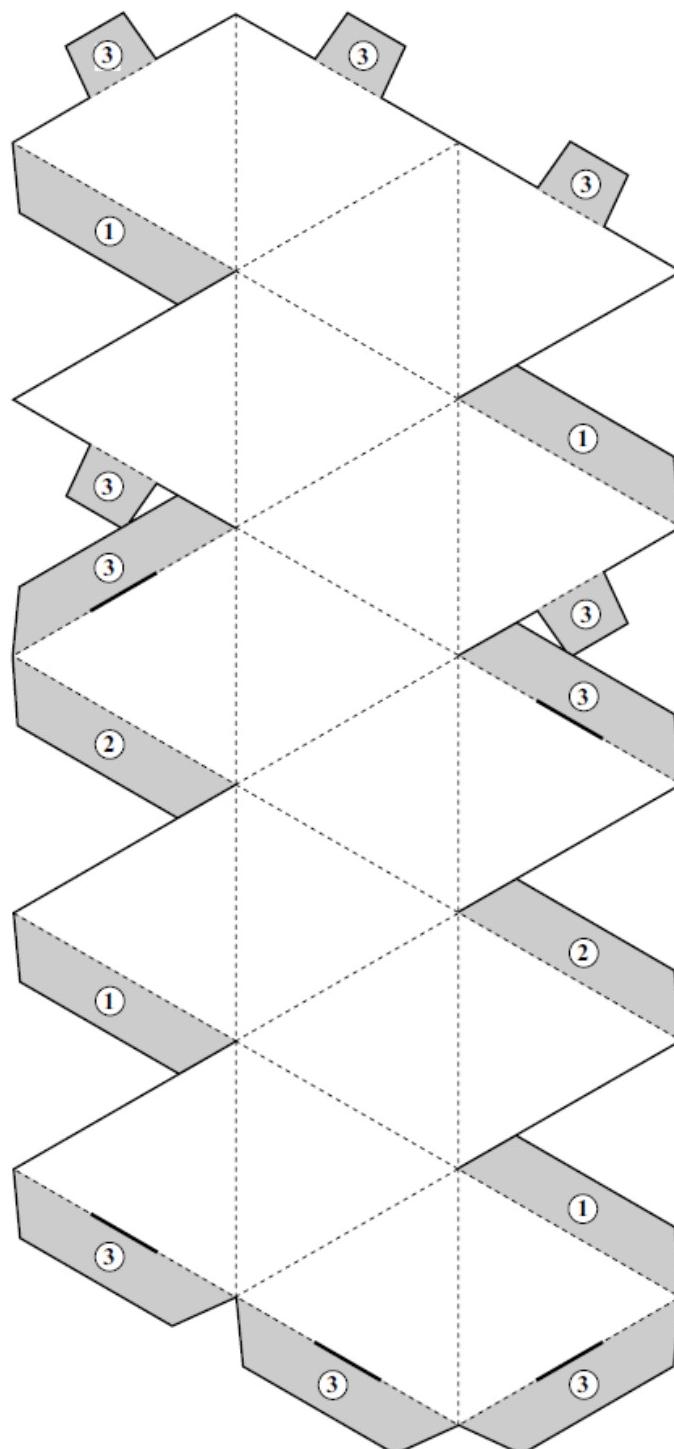


tetrahedron



octahedron





icosahedron

